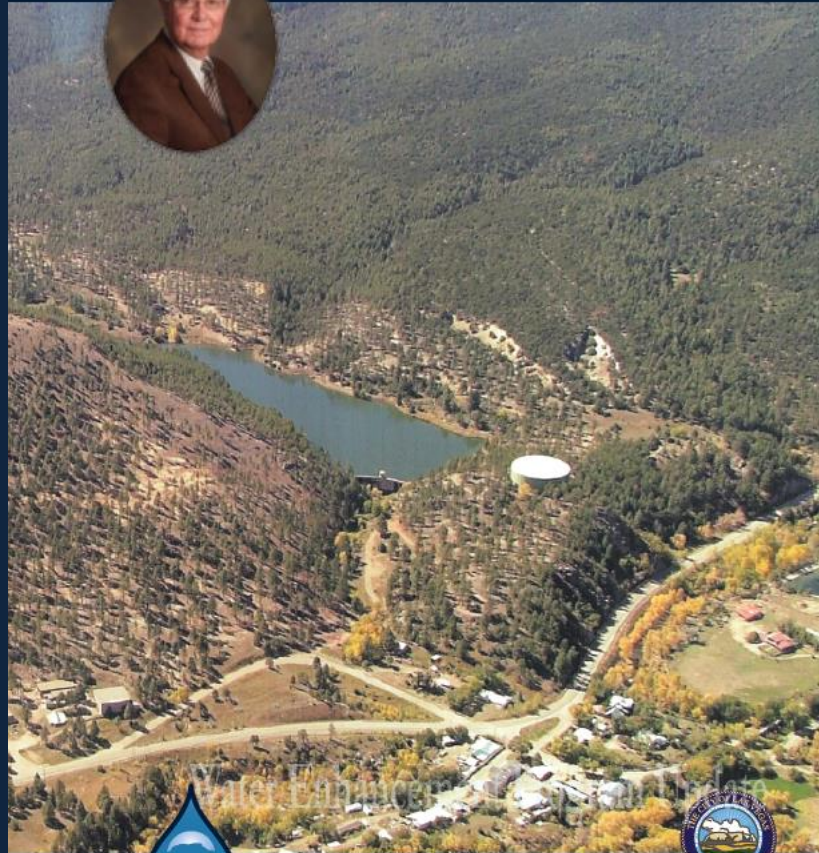


Water Enhancement Program Update



Thursday October 23, 2014

10am - 2pm

NMHU Campus, Student Center Ballroom

Welcome to Las Vegas

Mayor's Introduction



WELCOME:

Good morning and welcome. Let me begin by thanking all of you for taking time out of your busy schedules to attend today's Water update. As you know the City of Las Vegas has experienced many challenges in replacing and upgrading our water infrastructure.

PLANNING FOR THE FUTURE:

Fortunately, the City of Las Vegas has developed a comprehensive study and an Improvement Plan that addresses needed work in each of the major areas in the City's water system. The study results indicated that

there was a lot of catching up to do, and the cost of implementing the plan was beyond the City's existing financial capacity.

SEARCH FOR FUNDING:

In our efforts to search for Funding, we had to make some difficult decisions related to raising rates and aggressively seeking finances to meet the funding gap. The City has had a number of meetings with community, state and federal agencies and elected officials looking for support in implementing the Improvement Plan. Thankfully, state government agencies took a very active role due, in large to the leadership of our Governor Susana Martinez and our State Legislators. Their substantial knowledge and assistance put to work the beginning of a sound financial strategy.

FUNDING MIX

The City identified and evaluated each and every funding source available. The evaluation came down to cost benefit and allowed us to prioritize which funding agencies to target each step of the way. The results were a mix of local, state and federal dollars from four main sources:

1. Rate Revenue – The rate study completed and rate increase was based on the assumption that the community could only afford part of what the needs were. (this made possible a \$20 mil in capital debt capacity)
2. State Legislative Funding (we received \$12 mil)
3. State Water Trust Board Funding (we received \$6 mil)
4. Federal and State Revolving Loan Funding (made possible, \$17 mil debt covered by rate increases and a \$3 mil grant)...

SUPPORT/THANKS:

I wish to express a special thanks to a few of the many individuals that have made our funding challenge a success...(list) Additionally, with the support of City staff, community leaders, community members, US Representatives, US Senators, State Legislators, our Governor Susana Martinez and key staff in the Governor's office, we have been able to completely finance the detailed planning and engineering for each project. A number of projects are in various phases of detailed planning, construction and completion. There is still a ways to go to completely fund construction, but we are well on our way!

TODAY'S PRESENTATION:

Today, you will hear the details about the implementation of the 5 year Capital Improvement Plan. It is important that we all realize the accomplishments and progress that we all have made. Our efforts serve as a model to many other communities facing similar challenges and to creating a brighter water outlook which is a critical part of Economic Development and Quality of Life. The Water Enhancement Program is just one of the many programs within the community that will have an impact on improving our community.

Many thanks to all of you.

Sincerely,



Mayor Alfonso E. Ortiz Jr.



TONITA GURULE-GIRON
Councillor, Ward 1

VINCE HOWELL
Councillor, Ward 2

JOSEPH "JOEY" HERRERA
Councillor, Ward 3

DAVID L. ROMERO
Councillor, Ward 4



Morning Agenda

Introductory Presentations (10:15-11:00)

Historical Perspective

Kenneth L. Garcia, Utilities Director

- Water System History: A gift from Agua Pura
- System Components: From the River to your Tap
- Water Enhancement Program Overview
- Financial Highlights: Putting your money to work

Vision to Reality: Water Project Planning

Maria Gilvarry, Project Manager



Break/Informal Discussion (10min)

Technical Presentations, Infrastructure Update

Past Present Future (11:00-12:30)

Beyond Costly Infrastructure: Conservation Saves \$!

- Automated Meter Register Replacement -
Karen Jacobsen, WHPacific
- Leak Repair and Replacement -
Wayland Oliver, Engineers Inc.



Saving for the Dry Times: Raw Water Storage

- Raw Water Conveyance -
Tod Phinney, Souder Miller & Associates
- Bradner Dam Expansion -
Ed Toms, URS Corporation
- Peterson Dam Rehabilitation
 - a. Ed Toms, URS Corporation



Working Lunch/Informal Discussion (10min)

Technical Presentations, Infrastructure Update

Past Present Future (12:40-3:00)

Emergency Groundwater Plan



- Optimize Groundwater Taylor Wells
Kay, Daniel B. Stephens and Assoc.
- Desalination/Blending Facilities
Douglas Albin, Molzen Corbin

Safe Water is not an Option: Surface Water



- Water Treatment Plant Oxidation -
Chris Rodriguez, HDR Inc.
- Water Treatment Plant Repairs
Karen Jacobsen, WHPacific

Break/Informal Discussion (10min)

Finished Water Storage & Distribution

- Distribution System
- Water Storage Tanks



Recycled Water



Douglas Albin, Molzen Corbin

Closing Remarks:

Alfonso E. Ortiz, Jr., Mayor
Kenneth L. Garcia, Utilities Director

April 1835: pueblo of Nuestra

Senora de Las Dolores de Las Vegas Grandes
established under Mexican Law

**1835: Nuestra Senora de Las Dolores
de Las Vegas Grandes**

**1850: NM
Territory**

**1879: RR reaches
Las Vegas**

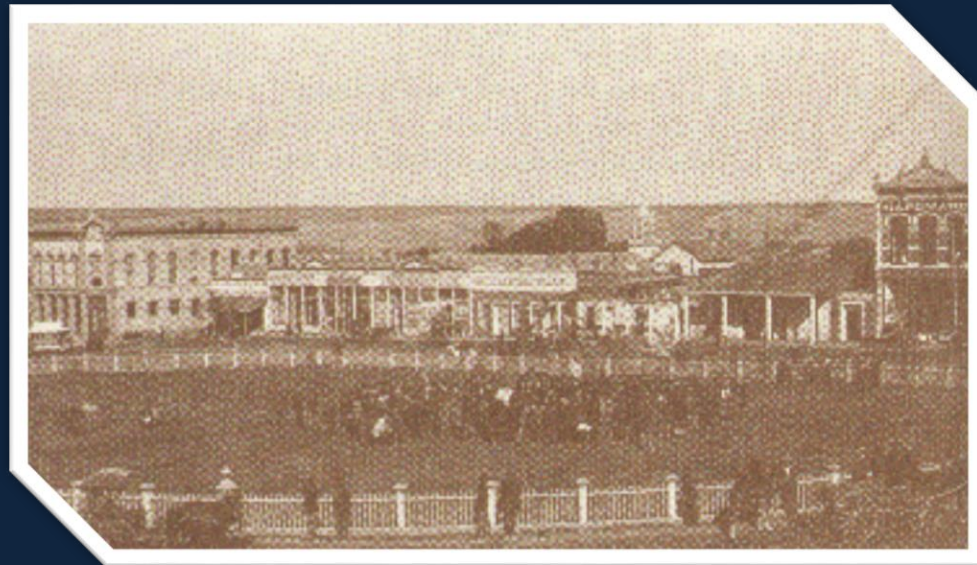
**1888: East
Las Vegas
Incorporated**

**1888: West
Las Vegas
Incorporated**

**1912: NM granted
Statehood**

**1970: East & West
Consolidate**

**1982: City receives
Water System**



1975

1995

2015

2025

2045

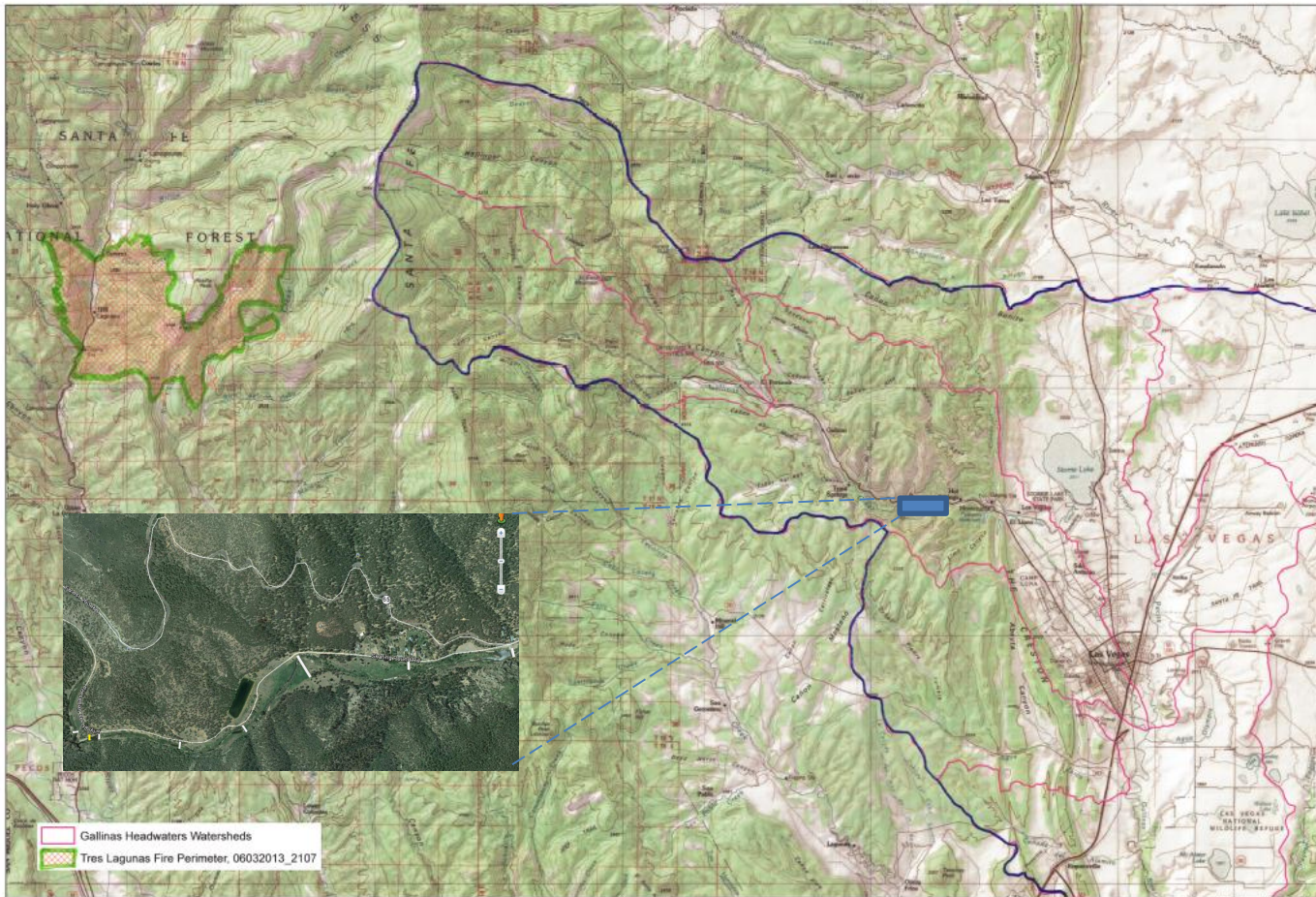
2065

2085

Gallinas Watershed (our source of supply)

Tres Lagunas Fire - Gallinas Watershed Relationship

6/4/13

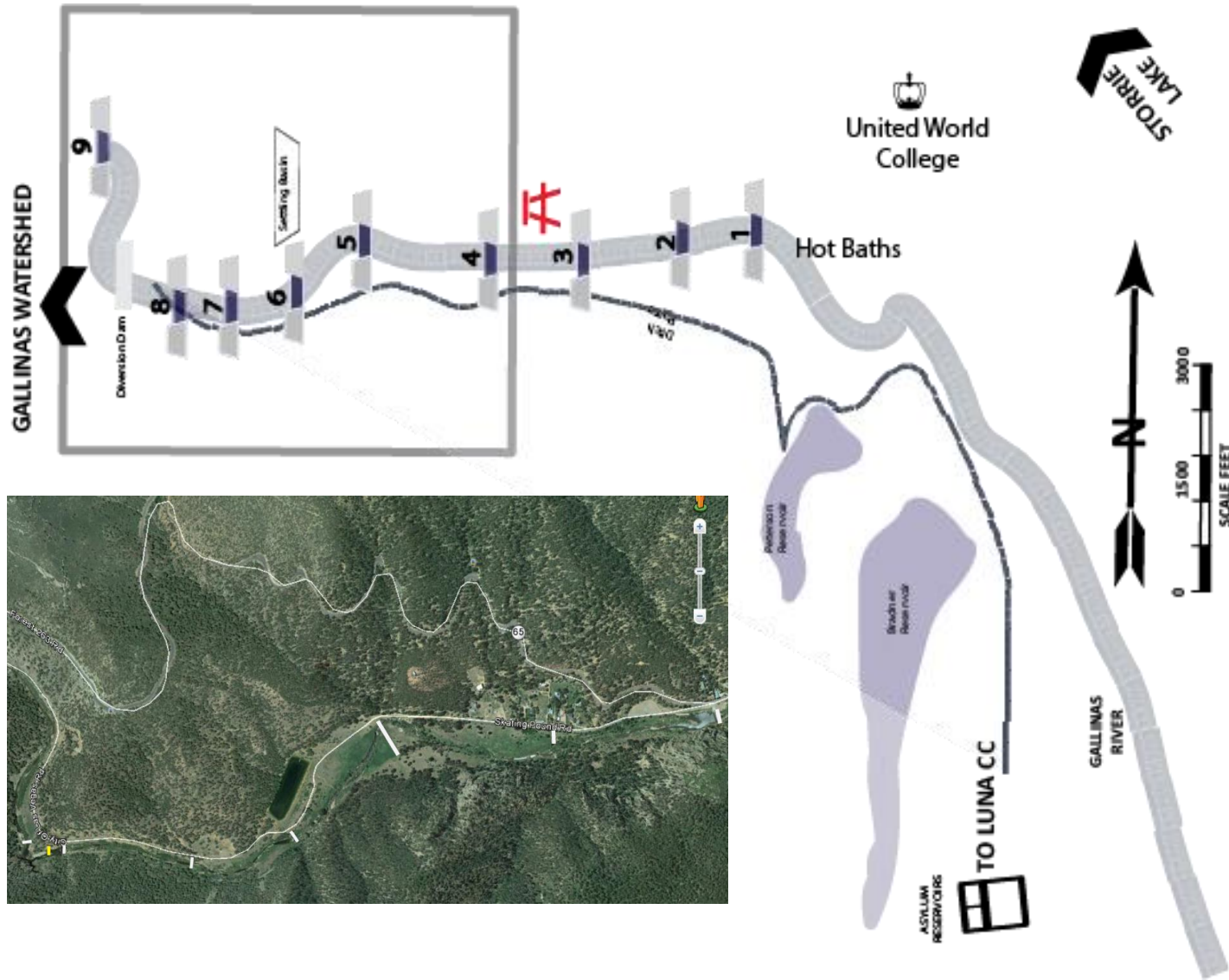


Sources:
Fire Perimeter: geomac.gov, 4 Jun 2013.
Watershed Boundary: USGS NHD, downloaded 2008.

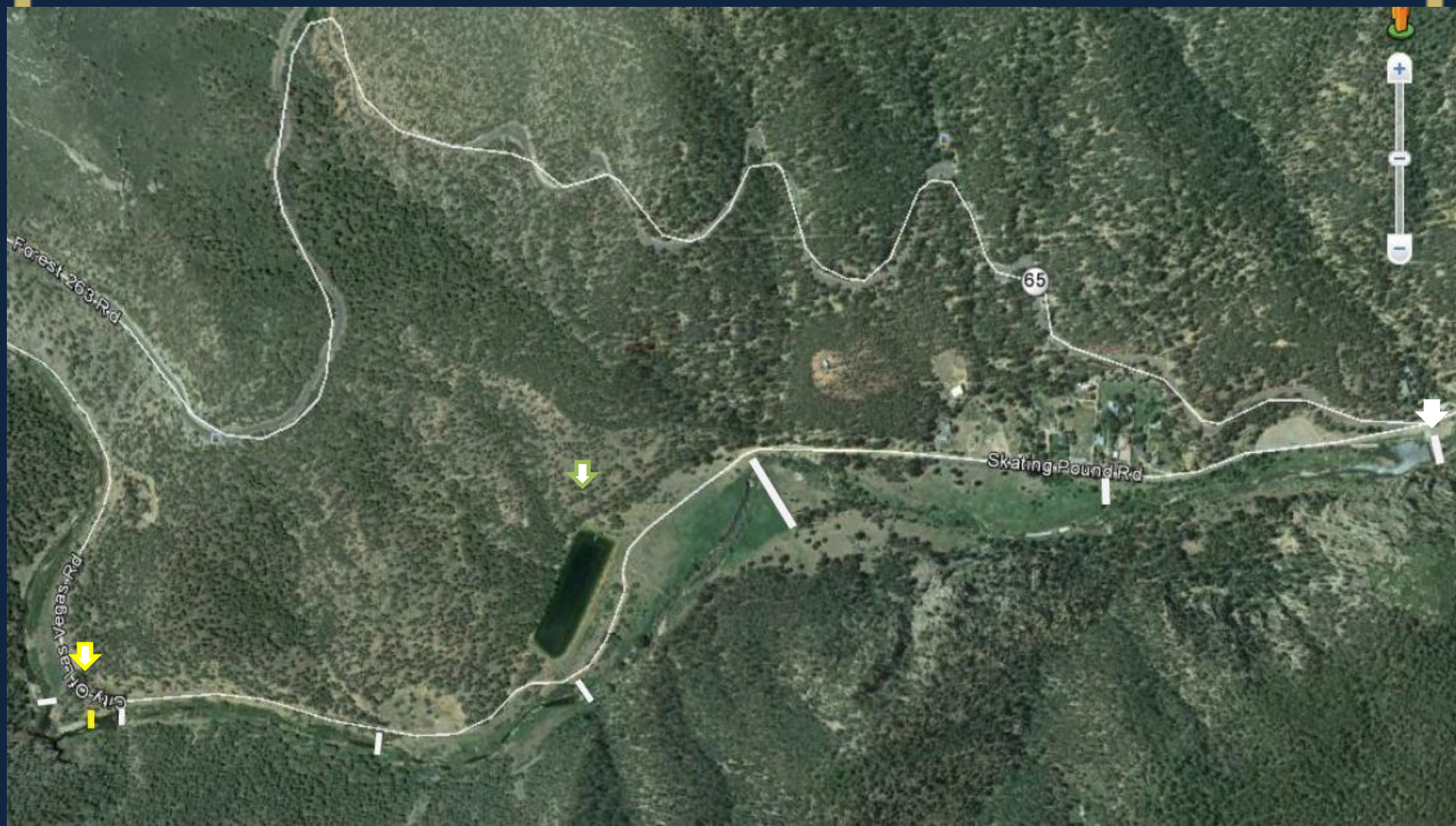


Raw water System

(pnm ca. 1957)



Ice Ponds Nos. 3-9



1835 to 1880:

Years Prior to Agua Pura Company "Pure Water Company"

1821: Luis María Cabeza de Baca filed a petitioned for 431,653 acres in the area known as Vegas Grandes, land which was granted to him in 1823. He was subsequently driven off the land by Indians.

1835: The pueblo of *Nuestra Señora de Las Dolores de Las Vegas* was established as colonization land grand under the laws of Mexican Republic. The grantees were given lawful and paramount right to so much of the waters of the Gallinas River which flowed through and by the pueblo as was needed by the present inhabitants and for the continued uses of water by inhabitants in the future.

1846: After the *United States declared war on Mexico*, General Stephen W. Kearney led his 1000 man Army of the West to Las Vegas to declare New Mexico a U.S. territory. When he arrived, he found a thriving settlement of 1,500 Spanish settlers. Training several very large cannons directly on the Plaza, the men of Las Vegas quickly surrendered. The settlement had a acequia "ditch" supplying water for the town.



1879: The Atchison, Topeka, and Santa Fe railroad reached the settlement. To save money on bridging the Gallinas River, the railroad ran its line a mile east of the old plaza at the center of town, prompting a building boom around the tracks and in effect creating two towns, one centered on the plaza and the other on the tracks. The new town's grid ran diagonal to that of old town, physically denoting the difference.

Las Vegas' location on the eastern slope of the Rockies made it one of the first stops eastward on the Santa Fe Trail, thus ensuring a certain amount of economic activity in the early years.

A tale of two cities: Once two separate municipalities (one a city and the other a town) both named Las Vegas, west Las Vegas ("Old Town") was incorporated in 1903 and is located west of the Gallinas River and east Las Vegas ("New Town") was incorporated in 1888 in the immediate area of the railroad. Both towns eventually merged into one municipality, but not until 1970 after citizens voted for consolidation.

The formation of Agua Pura Company (1888-1946)

In 1880, Agua Pura Company installed pipes to convey water to homes and fireplugs from a small reservoir "currently know as the ice skating pond" by constructing a dam a short distance above the Montezuma Hot Springs. The "creek" water supplied by the "Pure Water Company" that was not always pure as shown by its "murky" appearance and filth and rubbish in the reservoir - *One consumer described its effect of "creating an eruption in the gastric neighborhood similar to that brought on by eating green apples."*

Further, it was not always dependable, as the pressure was too low for the fighting of fires, the supply was so meagre that the reservoir emptied in times of drought, and bad floods periodically washed out the dam.

Ice for Everyone: Another use soon made the reservoir site valuable to the Community. In wintertime a high cliff kept the sun from shining all day on the pond, so that it remained frozen through several months. In that era a demand was growing for ice for use in railway freight cars and dining cars.

As soon as the Santa Fe Railroad built a spur line to the hotel at the Hot Springs in 1882 and on up the canyon to the pond site, the cutting of ice began on a large scale for sale to the railroad and others, even to the Central Railroad in Mexico.



Troubled Waters

On land leased from the Agua Pura the **Montezuma Ice Company** built eight more dams, creating altogether nine ponds, and the company also built ice storage houses between the ponds and the railroad track. Often 300 men were employed seasonally for the cutting of up to 50,000 tons annually. From those adjacent ice houses the freight trains hauled the ice to a large storage barn by the main track in town, whence it went forth for consumption as heeded.

1903: The spur line was adapted for use by trolley cars, a powerful electric locomotive pulled the freight cars back and forth. The railroad service was suspended in 1906, was superseded at first by the use of teams and wagons and in the 1920s by the use of trucks.

1904: there was a major flooding event drowning 12 people in the Watros area and causing major flooding throughout the area. *The Gallinas river formed a new channel. The Gallinas canyon the dams of the Agua Pura company broke, bringing a terrific flood on the city. The Montezuma Hot springs track went out in many places. Half a dozen bridges were destroyed and the Montezuma bath houses were partly carried away.*

USGS records for 1904 show that, prior to the storm and flood Sept 29 to Oct 1, there was practically no flow in the stream, and after the flood subsided there was but a slight flow. Records at the time showed a number of occasions when the flow would have been insufficient to materially augment the water supply. In fact, the records of the years 1904 to 1910 clearly indicate that additional storage was absolutely necessary in order to secure a permanent water supply. Average consumption at the time was 1.5 to 1.8 mgd.

Las Vegas prospered through 1905, its trade area was reduced as additional rail lines crossed the territory causing other New Mexico cities to rise in competition. A local agricultural depression in the mid-1920s followed by the Great Depression of the 1930s had a significant negative impact on the city's prosperity. A long period of dormancy ensued, with gradual growth and a commitment to historic preservation resulting in present-day Las Vegas.

Ice pond No. 6

1835

1855

1875

1895

1915

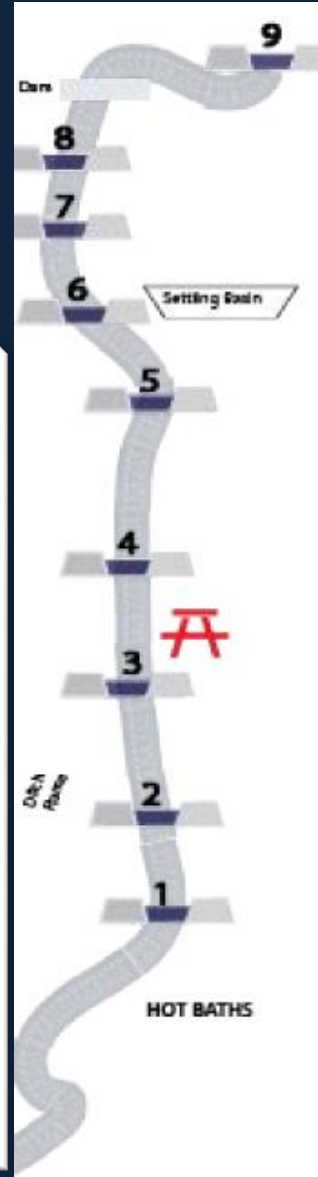
1935

1955



Ice pond No. 5 (today)

1835



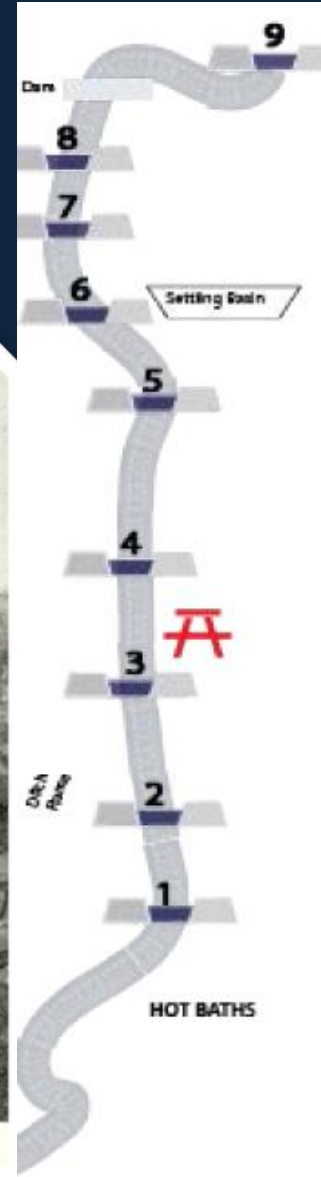
Ice pond No. 4

1835



Gallinas Canyon, 6 Miles from Las Vegas, N. Mex.

W. M. Lewis, Publisher.



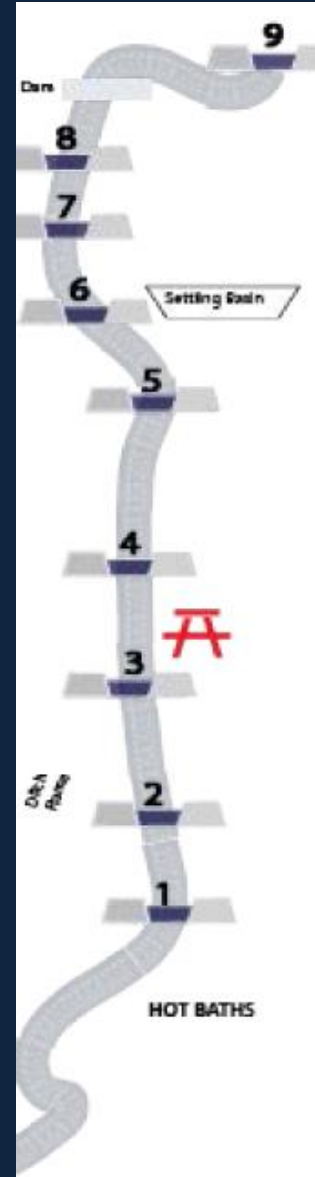
Ice pond No. 4

1835

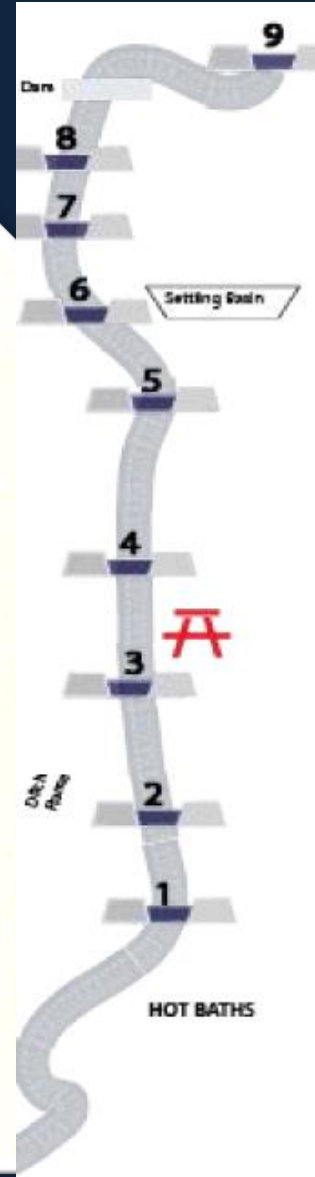
1855



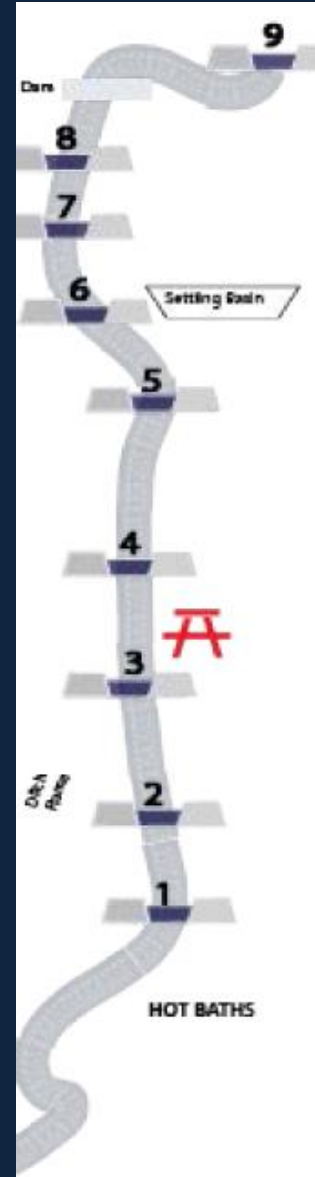
Ice pond No. 4



Ice ponds (1, 2, 3)



ICE POND No. 1 (1882)



To replace or Not to Replace?

1911 Peterson Dam: Three decades of controversies had arisen between the water company and the town about the cloudy water, the high rates, and the uncertain supply. In desperation the City Council in East Las Vegas even obtained authorization to float bonds

for the building of a municipal system which would have drawn the water from the river up at Trout Springs and piped it right past the Agua Pura works. Finally, after the company had obtained an injunction to halt that project and another to stop the City from fixing the water rates, Agua Pura floated a bond issue of \$75,000 and built a dam in Peterson Canyon in 1910 to



1911 for the creation of a reservoir capable of storing up to sixty million gallons of water.



A New Beginning

Diversion Dam: The flow into the new “peterson” reservoir was diverted from the stream above the ice ponds from “ice Dam No. 8”, conveyed in a ditch to the cliff towering over those ponds, and there in order to get it over, a ridge it had to be carried in a wooden flume on the face of that vertical cliff. The building of that flume was a spectacular feat, because the laborers had to crawl along at dizzy heights on ten inch planks supported by spikes driven into holes drilled in the granite wall.

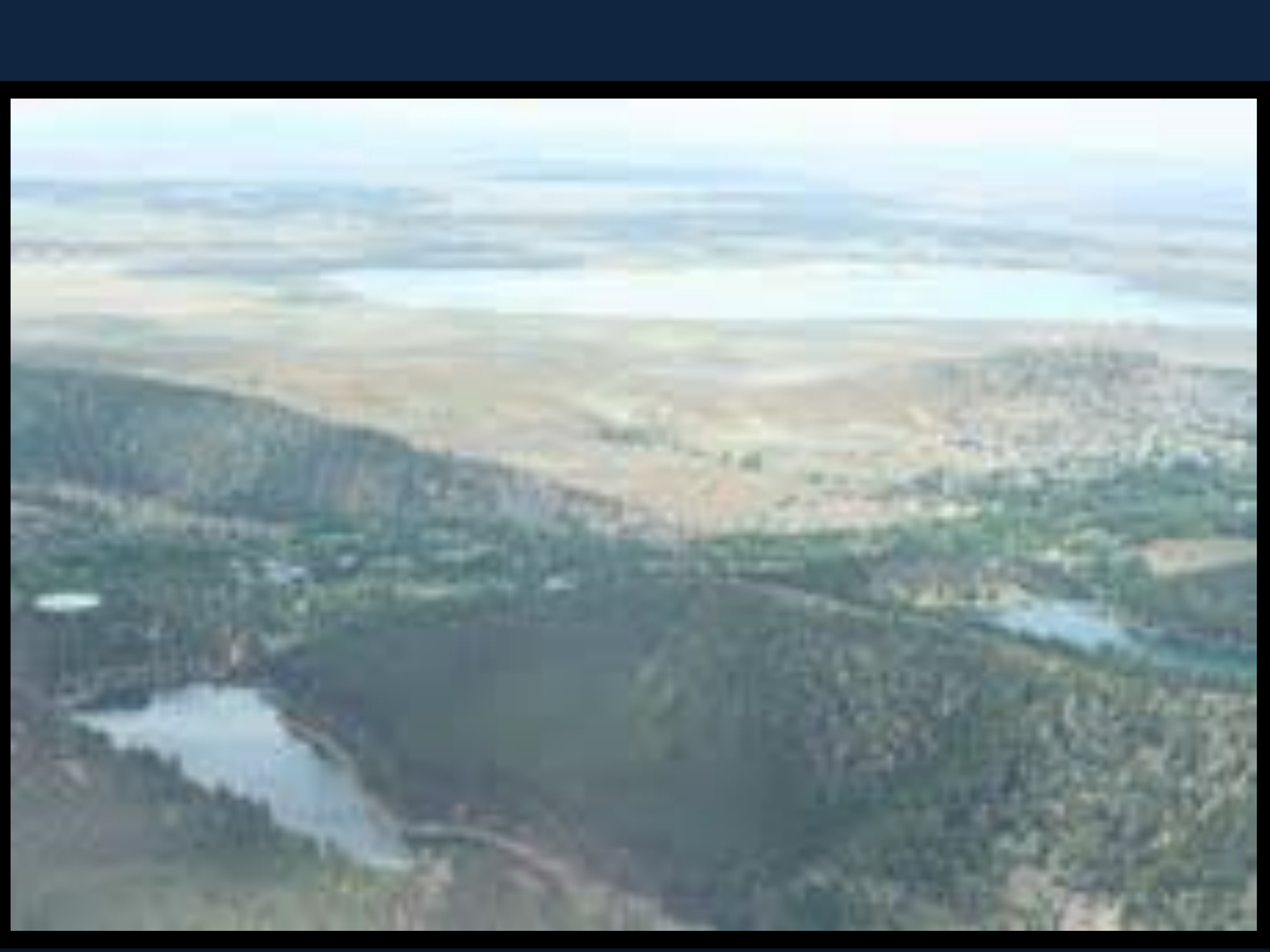
From this point which is at an elevation of 410 ft above the general city level, the water flowed 5.1 miles through a 12 in pipe to a distributing reservoir (asylum reservoir) two miles north of the city (immediately south of Camp Luna) and at an elevation of approximately 281 ft above the city level. From The asylum reservoir the water was then distributed to the pipe system of the city by two circuits thus insuring the city ample pressure and safety in case of need of repairs to either of these pipe lines.



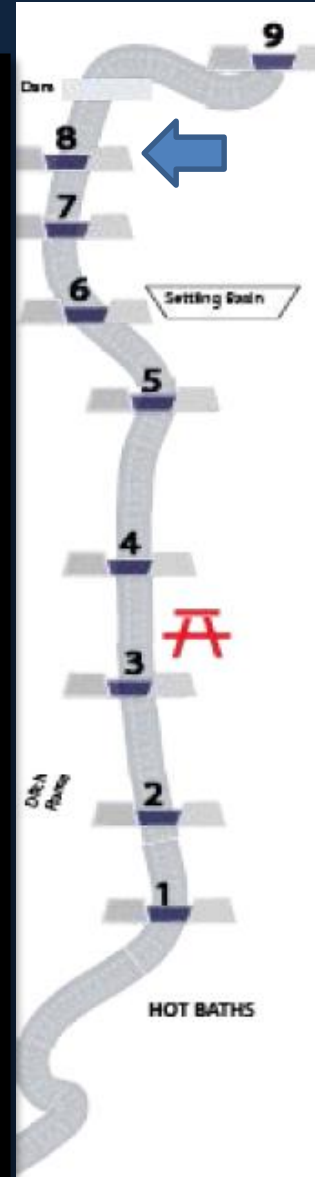
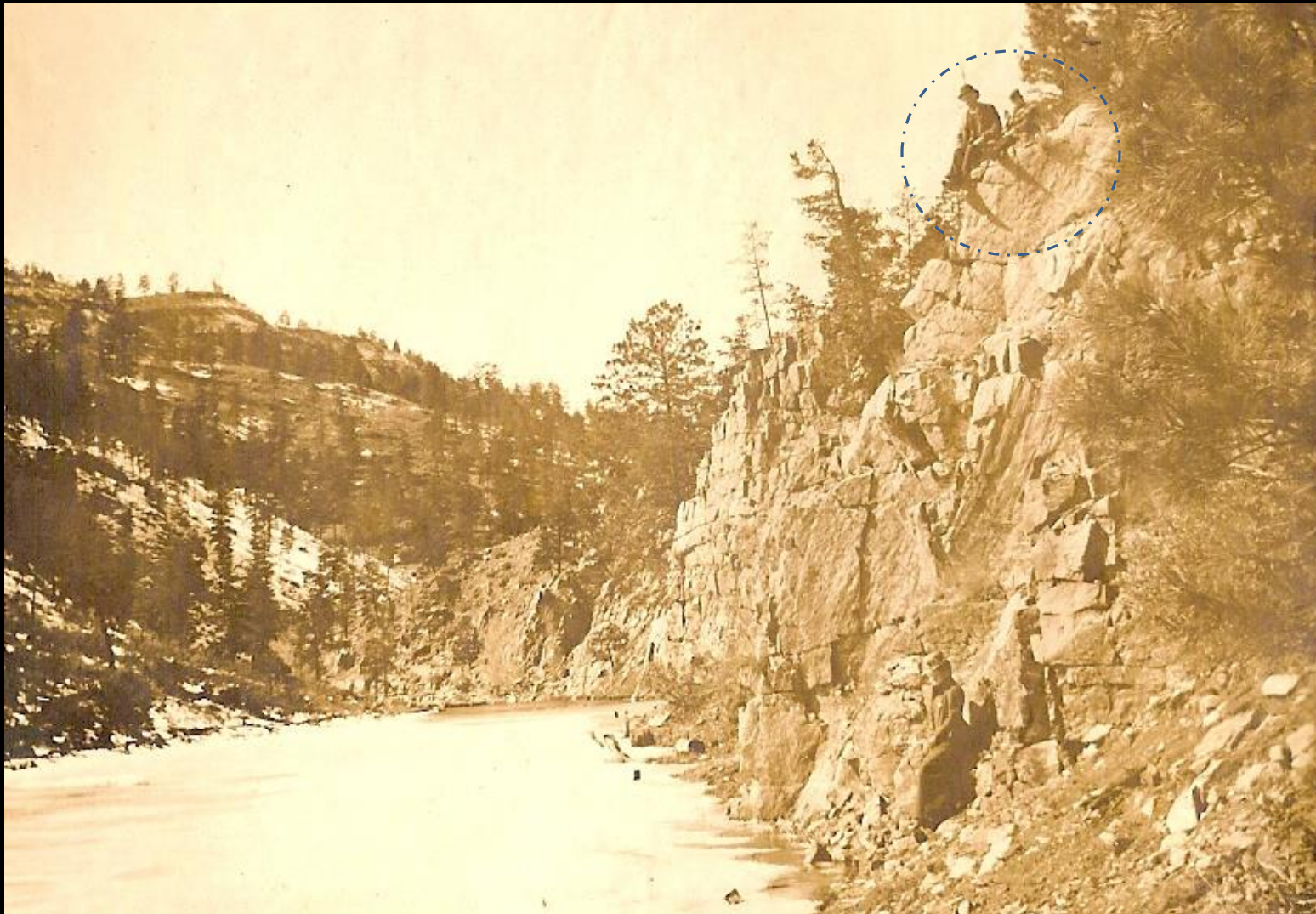
The Diversion Dam as it existed in 2011, the old ice pond no. 8 dam had been replaced by the by Public Service Co. of NM



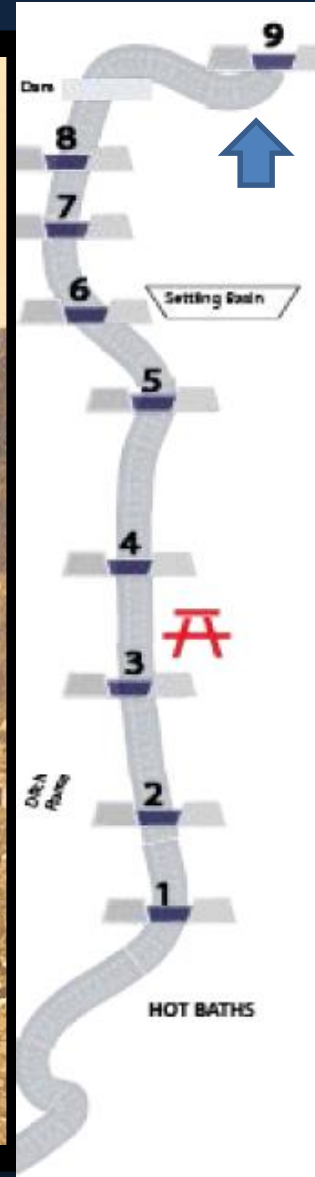
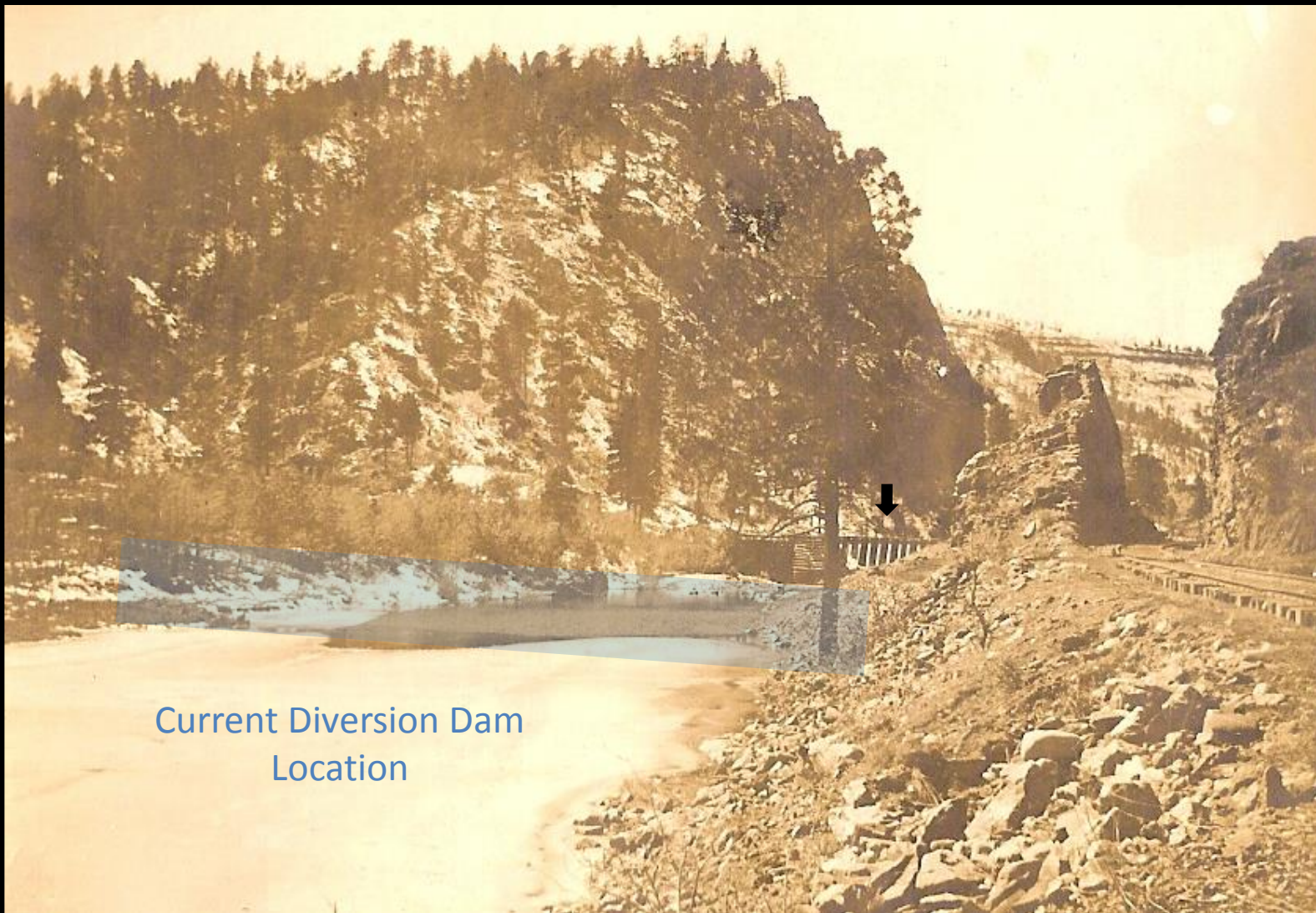
FIG. 2.
UPSTREAM FACE OF DAM DURING CONSTRUCTION.



Diversion Area (Sept 1967)



Ice Pond No. 9



Sedimentation Pond



Flashback to the Past

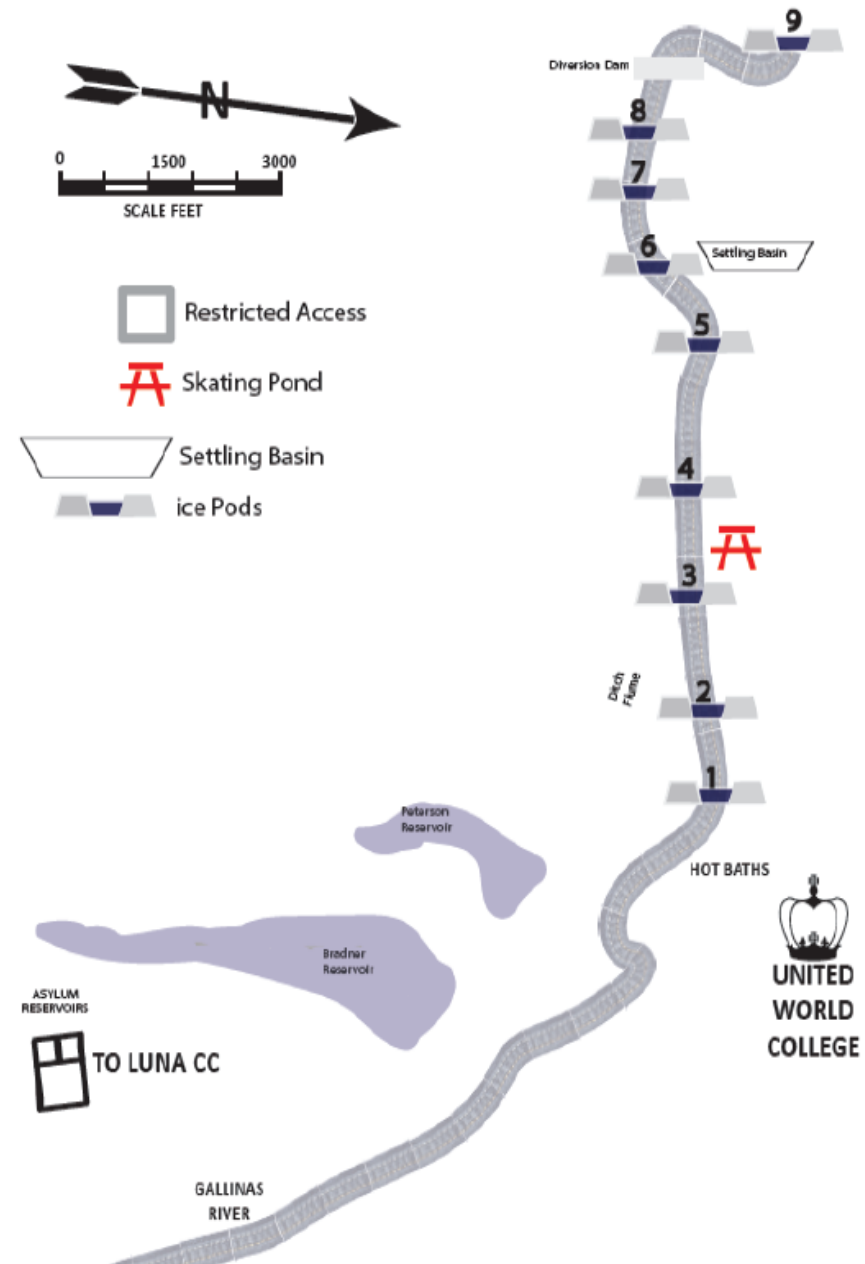
Gallinas Park: Periodically as floods destroyed the dams they, had been rebuilt; but with only one function remaining, thenceforth only one dam was rebuilt after later floods in order to maintain at least the one pond for fishing and skating. First, the local 20-30 Club promoted, and supervised, this recreational facility and built a cabin for that purpose on a small tract acquired north of the road and pond. In 1961 the club conveyed that tract of one and nine-tenths acres to the City of Las Vegas, and seven years later the City negotiated a twenty-five year lease with the Public Service Company for approximately twenty-five acres, including the pond and a small wooded area south of it.

Finally the municipal "Gallinas Park" had emerged, as a site attractive to skaters, fishermen, and picnickers, while retaining also its old, stone abutments and foundations as reminders of an earlier era of dual commercial use vital then to the economy not only of Las Vegas but also of the railroad systems hauling fruits and vegetables. In the entire West there were only a few sites where ice production so voluminous was maintained in the heyday of that industry.

The original dam (Ice Pond No. 3) or ice skating pond as it was also called, was constructed in 1880 and was approximately 20 feet tall. It was replaced in 1994 with a shorter dam that is 10ft tall, after damage by a flood in 1991. The City had petitioned the Corps of Engineers for assistance in evaluating the structural fitness of the dam. Their report found that the dam "structure" was inadequate and recommended that the 20 foot dam be breached. Later that year, the City received notice from the Office of the State Engineer (OSE), Dam Safety Bureau that the dam be breached. The City complied in late 1992.

The City dredged the site in 1993 to prevent sediment from impacting the downstream areas. The City then constructed a 10 feet dam apparently due to the a OSE requirement that a dam higher than 10 require approval of plans and specifications. Despite periodic attempts to revive the pond, the area has limited use to this day.

Water System Components GALLINAS WATERSHED



Funding Sources / PER Phase I and Water Distribution System Projects

CATEGORY	PROJECT	COST	GRANT FUNDS	CITY FUNDS	% FUNDED
 CONSERVATION	<ul style="list-style-type: none"> AUTOMATED METER READING 	\$1.1	\$0.8	\$0.3	 100
 STORAGE	<ul style="list-style-type: none"> BRADNER DAM EXPANSION PETERSON DAM - Repair/Replace RAW WATER CONVEYANCE 	\$45.3	\$20	\$17.3	 60
 TREATMENT	<ul style="list-style-type: none"> TREATMENT PLANT OXIDATION TREATMENT PLANT BUILDING REPAIRS 	\$3.7	\$1.1	\$1.1	 59
 GROUND WATER	<ul style="list-style-type: none"> TAYLOR WELL FIELD DESALINATION OF TAYLOR WELL #7 	\$18.8	\$2.1	\$1.4	 19
 DISTRIBUTION	<ul style="list-style-type: none"> STORAGE TANKS - INSPECT / REHAB DISTRIBUTION SYSTEM IMPROVEMENTS ANNUAL LEAK REPAIR / REPLACEMENT 	\$6.3	\$2.0	\$0.2	 30
 REUSE / RECYCLE	<ul style="list-style-type: none"> EFFLUENT REUSE EXPANSION 	\$3.2	\$1.3	\$0.5	 56
TOTAL (millions)		\$78.4	\$23.4	\$20.8	56.3%

The Annual Water Enhancement
Report will be coming out soon!

**Special Thanks to NMHU President Fries
&
Employees for making this Event Possible!**



Thank You